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How Reserch on English as a Lingua Franca can Help to Identify and Adress New Training Needs of the Changing Aviation Community

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How research on *English as a Lingua Franca* can help to identify and address new training needs of the changing aviation community

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1. Introduction: the changing aviation community

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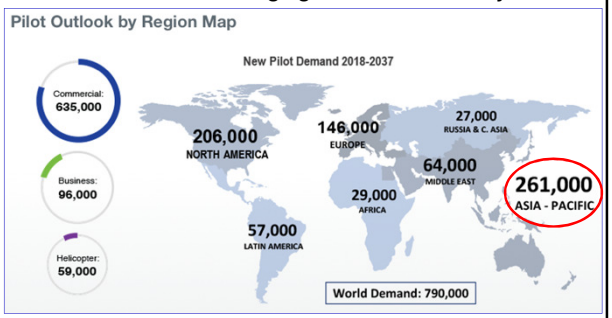

(https://www.boeing.com/commercial/market/pilot-technician-outlook/2018-pilot-outlook/, last accessed Apr 29, 2019)

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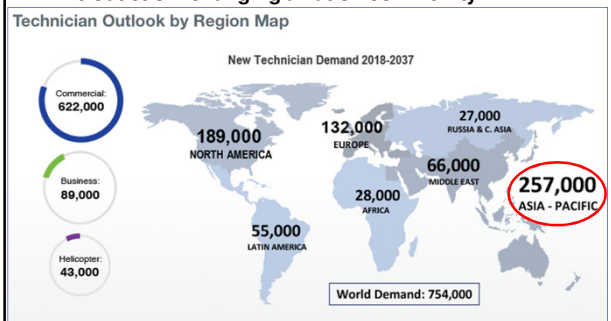
1. Introduction: changing aviation community



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1. Introduction: changing aviation community

- the largest group of new pilots and technicians will be from "outer and expanding circle" countries (cf. Kachru 1985)
- i.e. a significant and growing proportion of the members of the aviation community will not be native speakers of English, but often native speakers of languages that are typologically very different from English (e.g. tone languages and/or different structure and/or writing system)
- **English will be increasingly used as a Lingua Franca (ELF) in the aviation community and the language background of these users will be different from ELF users in aviation in the past → similar to general ELF**

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2. Relevant ELF Research

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- for the purpose of this presentation, ELF means:
  - "communication in English between speakers with different first languages" (Seidlhofer 2005: 339)
  - "the common language of choice, among speakers who come from different linguacultural backgrounds" (Jenkins 2009: 200)
- nns-nns and nns-ns communication

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2. Relevant ELF Research

- commonly found views in the ELF community
  - "… non-native speakers of English outnumber native speakers of the language" (Seidlhofer 2008: 160)
  - "It is now widely accepted that the world's largest number of English speakers come from the countries of the expanding circle (Kachru, 1992) and that the majority of communication involving the use of English by its non-native speakers (NNSs) does not involve its native speakers (e.g. Beneke, 1991: 54 suggests a figure of eighty per cent)." (Jenkins 2008: 145)
  - **increasingly true for the aviation community**

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- frequent claims
  - English does no longer 'belong' to the native speakers
  - "the control over the norms of how it 'should be used'" should no longer "rest with the minority of the its speakers, namely English native speakers" (Seidlhofer 2008: 170)
- result: identification/suggestion of (teachable) ELF features

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2. Relevant ELF Research

- identification/suggestion of ELF "features"
  - e.g. Jenkins' "lingua franca core" (pronunciation)

Table 1: EFL vs. ELF pronunciation targets

	EFL targets	ELF targets
1. The consonantal inventory	• all sounds	• all sounds except /θ/, /ð/ and [ɬ]
	• RP non-rhotic /r/ • GA rhotic /r/	• rhotic /r/ only
	• RP intervocalic [t] GA intervocalic [r]	• intervocalic [t] only
2. Phonetic requirements	• rarely specified	• aspiration after /p/, /t/, /k/ • appropriate vowel length before fortis/lenis consonants
3. Consonant clusters	• all word positions	• word initially, word medially
4. Vowel quantity	• long-short contrast	• long-short contrast
[etc.]		

(Jenkins 2008: 146)

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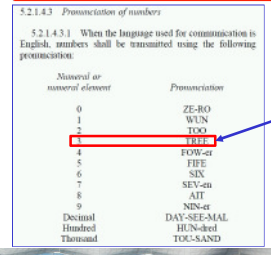

5.2.1.4.3 *Pronunciation of numbers*

5.2.1.4.3.1 When the language used for communication is English, numbers shall be transmitted using the following pronunciation:

Numeral or numeral element	*Pronunciation*
0	ZE-RO
1	WUN
2	TOO
3	TREE
4	FOW-er
5	FIFE
6	SIX
7	SEV-en
8	AIT
9	NIN-er
Decimal	DAY-SEE-MAL
Hundred	HUN-dred
Thousand	TOU-SAND

→ replacement of (inter-)dental fricatives by alveolar stops

(ICAO 2016: Annex 10, Volume II: 5-5)

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2. Relevant ELF Research

- identification/suggestion of ELF "features"
  - e.g. Jenkins' "lingua franca core" (pronunciation)
  - e.g. the Vienna-Oxford International Corpus of English (VOICE) (lexicon and grammar)

VOICE **Vienna-Oxford International Corpus of English**

It is the ultimate aim of the VOICE project to open the way for a **large-scale** and **in-depth linguistic description** of this most common contemporary use of English by providing a corpus of spoken ELF interactions which will be accessible to linguistic researchers all over the world.

The widespread use of ELF in the world and the availability of a description of its linguistic characteristics are likely to have considerable implications for the way objectives of English teaching might be defined. It is important to stress, however, that a consideration of such pedagogic implications is not within the scope of the VOICE project itself.

(https://www.univie.ac.at/voice/page/what_is_voice, last accessed Apr 29, 2019)

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2. Relevant ELF Research

- today: situation has changed completely (cf. Sifakis 2017)
- Jenkins (December 2016):
  - "ELF is a fluid, flexible and variable phenomenon"
  - "you can't say it's got certain features we could teach"
  - **this variability is not conducive to effective, efficient, unambiguous and safe aviation communication**
- Sifakis (2017: 16) confirms this and concludes that "ELF is not one specific codifiable variety"
  - he suggests "ELF-aware" EFL-teaching instead

1) What can we learn from ELF research?

2) How can it help us to identify and address the changing training needs of an aviation community that is characterized by an increasing proportion of members for whom English is not their native language and thus a lingua franca?

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Transition

- studies have shown that both **speech rate** and **accent** have a variety of effects on intelligibility in ELF situations
  - cf., e.g. Matsuura et al. (2014) on "Accent and speech rate effects in English as a lingua franca" (general ELF)
  - (controller) accent and speech rate were subjectively identified as the two top factors causing "similar call sign communication occurrences" in a Eurocontrol (2006: 37) survey:

- Controller accent (34% [8])
- Controller speech rate (28%)
- Pilot distraction (25%)
- Pilot expectation (22%)
- Pilot fatigue (20%)

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  - even in communication among native speakers, the two factors were identified as important influences (Prinzo et al. 2010: 3)

Table 3. Pilot Reports of Communication Problems Experienced in Native English-Speaking Airspace/Airports.

Alternative	Number of Pilots	%	Issues
Rarely (< 10% of my interactions with controllers)	38	79	Speech Rate and Accent
Occasionally (10-24% of my interactions with controllers)	7	15	Phonetics Versus Fix Name
Frequently (25-74% of my interactions with controllers)	2	4	The U.K.$_a$ and East Caribbean
Often (75-90% of my interactions with controllers)	1	2	LAX$_b$ Versus Dulles Dialect
Without Fail (> 90% of my interactions with controllers)	0	0	

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  - even in communication among native speakers, these factors were identified as important influences (Prinzo et al. 2010: 3)
  - "radio transmission skills such as pronunciation, **speech rate** and **accent** have been cited as leading contributing factors in communication problems in both commercial aviation and general aviation" (Molesworth & Estival 2015: 73, my emphasis)
- focus on speech rate and accent

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3. Speech rate and accent

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3. Speech rate and accent – speech rate

- the effect of different speech rates on comprehension is not entirely clear → hints!
- Matsuura at al. (2014) investigated comprehension in relation to speech rate and accent in ELF
  - particularly for "heavier accents", which occur frequently in ELF communication, there was **"a significant speech rate effect on comprehension"** and "both higher and lower proficiency groups appeared to have benefited from a slowed speech rate" (Matsuura et al. 2014: 149)
- Estival & Molesworth (2016: 168) found that "low qualified NES [= native English speaking] pilots and all EL2 [= non-native English speaking] were adversely affected by faster ATC speech rate"

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3. Speech rate and accent – speech rate

- for aviation, earlier studies had suggested that speech rate does not have a significant effect on comprehension (e.g. the often cited study "Barshi 1997" described in Barshi & Farris 2013)
  - but: the **experimental design** was **unnatural** and does not reflect the reality of the aviation community
    - e.g. "heavier [native/non-native] accents" did not play a role
    - e.g. only "experimental phraseology" (76) was used, but no plain language at all
    - e.g. pauses between words were inserted or removed, but the articulation of the words remained unchanged

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  - but: faster speech rate goes hand in hand with reduction/elision
    - e.g. Jurafsky et al. (1998: 3112; e. m.) claimed that "Speech researchers have long noted the **association between faster speech**, informal styles, **and more reduced forms**." – "the odds of a full vowel at the slow rate was 2.2 times the odds at the faster rate" – speech rate was among four factors that "all play strong and independent roles in whether a word is reduced" (3114)

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  - but: faster speech rate goes hand in hand with reduction/elision
  - but: the "fast" speech rates tested were much slower than fast speech rates encountered in authentic ATC communication
    - Barshi & Farris (2013: 83) report that "the fast speed was similar to normal speaking speed and the slow rate was very clearly slower than normal"
    - **"normal"?** – Götz (2103: 15) reports that the "average" (cf. Barshi's "fast" category = "similar to normal speaking speed") speech rate of native speakers is 160-210 wpm
    - cf. also Estival & Molesworth (2016: 146): "slow" average 89.5 wpm, "fast" average 159.76 wpm

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  - but: the "fast" speech rates tested were much slower than fast speech rates encountered in authentic ATC communication
- **questionable conclusion** by Barshi & Farris (2013:108): "Controllers need not be overly concerned about speech rate as long as they speak clearly."
  - has often be misinterpreted as 'speech rate does not matter'

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3. Speech rate and accent – speech rate

- speech rates frequently encountered at busy airports, particularly in "inner circle" countries, are often considerably higher than the speech rates tested for impact on comprehension in experiments

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  - JFK: Jetblue forty three kennedy ground runway three one left intersection kilo kilo monitor one two one point six five wait for ground to call you (278 wpm) [all audio from www.liveatc.net]

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  - JFK: Jetblue forty three kennedy ground runway three one left intersection kilo kilo monitor one two one point six five wait for ground to call you (278 wpm)
  - JFK: KLM six four one heavy kennedy tower following airbus three twenty wind three one zero five runway three one right cleared to land (314 wpm) [all audio from www.liveatc.net]

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3. Speech rate and accent – speech rate

- speech rates frequently encountered at busy airports, particularly in "inner circle" countries, are often considerably higher than the speech rates tested for impact on comprehension in experiments, e.g.
  - audio 1: 278 wpm
  - audio 2: 314 wpm

speech rates in native speech (interviews)	words per minute
fast	above 250 wpm
moderately fast	210 to 250 wpm
average	160 to 210 wpm
moderately slow	120 to 160 wpm
slow	below 120 wpm

(Götz 2013: 15)

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3. Speech rate and accent – speech rate

- speech rates frequently encountered at busy airports, particularly in "inner circle" countries, are often considerably higher than the speech rates tested for impact on comprehension in experiments
- Trippe & Baese-Berk (2019: 41) confirm that "Aviation English is spoken faster than [native] Standard English"
- Cauldwell (2007) found that even at airports in the "expanding circle" (e.g. Frankfurt), "control" spoke with an average speech rate of 190 wpm
  - faster than what has been tested and far above the 100 wpm speed limit recommended by the ICAO

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- Cauldwell (2007) found that even at airports in the "expanding circle" (e.g. Frankfurt), "control" spoke with an average speech rate of 190 wpm
- no surprise that speech rate is among the **top complaints** by native speakers and non-native speakers alike
- fast speech rates and the associated articulatory effects (reduction, coarticulation, elision etc.) **do affect comprehension**, particularly in "accented" communication

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3. Speech rate and accent – accent

- the ICAO (2010: 5-6; e. m.) requires that all pilots and controllers "take care to acquire an **internationally understood accent** or dialect" – **whatever that means?**
  - English is plurilithic and pluricentric
- studies have shown that **accents do influence comprehension** (cf., e.g., Matsuura et al. 2014)
- since AvE means ELF for an increasing proportion of stakeholders, an **"ELF pronunciation"** (cf. Jenkins 2002, 2008) **seemed like a possible solution**
  - unfortunately, the group of ELF users is so heterogeneous that no common and teachable "core features" could be identified and suggestions of features have not caught on
- **What does all of this mean for the training needs of the changing aviation community?**

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4. Implications for the training needs of the changing aviation community

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4. Training needs of the changing aviation community

- **dilemmas concerning speech rate and accent**
  - many stakeholders will most likely continue to ignore the ICAO **speech rate** recommendation of max 100 wpm
  - there is no one teachable international ELF **accent**
  - among other things, **linguistic accommodation** could help with both issues

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4. Training needs of the changing aviation community

- **speech rate**
  - teaching that high speech rates are not desirable and can be counterproductive
  - teaching that speaking slowly is OK and can even be a tool to slow down the speech rate (accommodation)

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4. Training needs of the changing aviation community

- **accent:** there is no one international ELF accent
  - learners should be taught and actively speak one of the few well-codified accents common in TEFL
    - Matsuura et al. (2014: 148) showed for an ELF setting that "an unfamiliar accent significantly reduced the participants' understanding of English"
    - familiarity and accommodation

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4. Training needs of the changing aviation community

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  - learners should be taught and actively speak one of the few well-codified accents common in TEFL
    - Matsuura et al. (2014: 148) showed for an ELF setting that "an unfamiliar accent significantly reduced the participants' understanding of English"
    - familiarity and accommodation
  - plus passive familiarization with many native and non-native accents of English

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4. Training needs of the changing aviation community

- **training has to lead to confidence**
  - misunderstandings are not necessarily due to the lack of proficiency or fluency (not "personal failure")
  - illustrate that misunderstandings do not only occur when non-native speakers are involved

- BA pilot: I'm sorry, I'm very new and you say it **so quickly** and in such a **strange accent**, I just don't understand (liveatc.net, Dec 11, 2003; KJFK)

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Thank you!

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